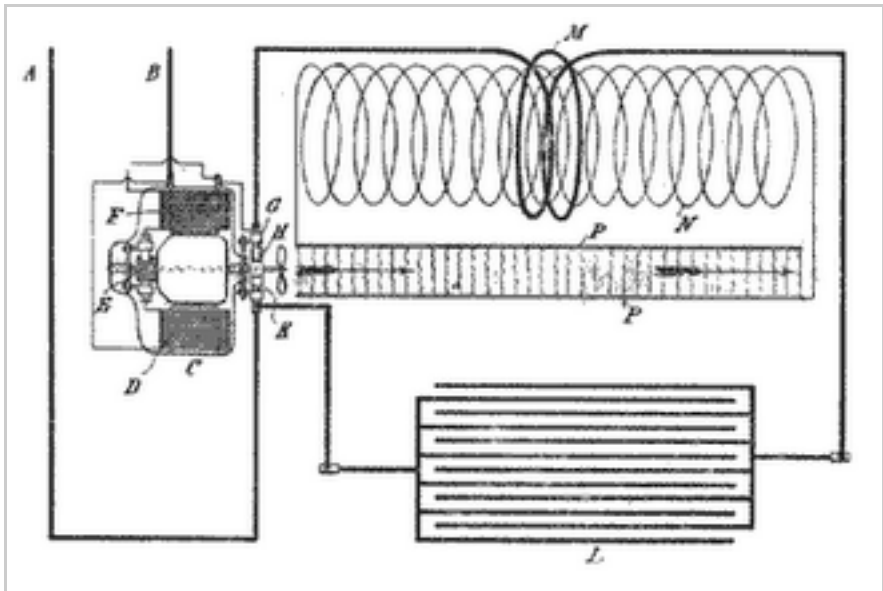


TESLA PATENTS MADE SIMPLE

A PICK FROM SEVERAL HUNDRED PATENTS ISSUED TO NIKOLA TESLA, ANALYZED AND SIMPLYFIED, FOR BETTER UNDERSTANDING OF THE WORKING PRINCIPLES INVOLVED. I AM NOT A PROFESSIONAL ENGINEER, BUT RATHER A HAPPY AMATEUR. ALSO ENGLISH IS NOT MY FIRST LANGUAGE SO ANY COMPLAINTS ABOUT BAD SPELLING IS A WASTE OF TIME :-)

WEDNESDAY, FEBRUARY 28, 2007

Battery operated teslacoil



This patent: (568177 apparatus for producing ozone) is a very important one. Not because it describes

how to make ozone, but it shows the way he uses the different subparts of the system. the same ideas are present in other patents as well, for example 609250 electrical igniter for gas engines.

Basic operation for a battery operated tesla-coil!

This is a portable, lightweight and simple system. It is a low voltage battery operated device , wich of course makes it differ from many of the present teslacoils that uses high voltage transformers to operate. Now, this particular setup uses an electric motor for both generating the high voltage and to power the fan that blows through the duct that contains the ozone.

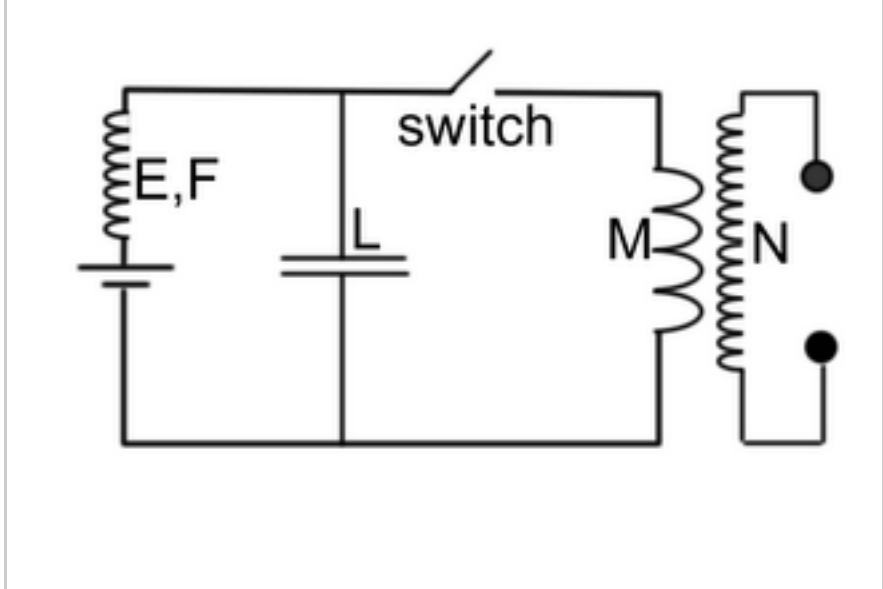
Only a few very easy obtainable parts are needed to replicate this unit:

- one large inductor (coil with many turns of fine wire)
- one battery
- one capacitor
- one primary coil
- one secondary coil
- circuit breaker (switch)

Simplified sketch of the circuit above.

Reading the patent, and looking on the drawings is not an aha moment. At the first look I'm wondering: how am I going to get anything out of this image? what does he mean? how does it work? well, it helps printing it out and spending a fair ammount of time with it spread out on the table and a large cup of coffe in your hand. While reading the text and checking the images over and over again you will understand eventually...i think ;-)

Anyway as i struggled to understand how these inventions of him worked I began to make my own sketches of the circuits, on paper. Twisting and turning them to get them more like todays layouts. Also removing redundant and non interesting features. So here is a image of the system above in my interpretation:



The switch is in this patent operated by the motor. When power is ON, the motor spins and the breaker (G,H,K) in the patent switches the primary coil(M) in

and out. what happens is that when the switch is ON, current flows through both the motor(E,F) and the primary coil(M) and back to the battery. At this stage the capacitor(L) will have almost the same potential as the battery say like 12 Volt? The resistance from the two coils EF and M determine the current trugh the circuit. what happens next is that the switch opens and is in OFF position. No current can go through the primary coil(M), it is shut off completely. On the other hand the motor windings react in a brutal way. They where carrying a current, and suddenly the path is broken. The coil "spikes" wich is Lentz law kicking in. The coil will want the current to continue and the way it does that is to rise the potential over itself. So in the upper branch of the diagram we now goes from near 12 volt (if that is our battery voltage) to maybe several hundred of volts perhaps even thousands. It depends on the coil how high the voltage spike will be. but look this voltage is applied right over the capacitor! it charges up to this to a high voltage. The cap needs to be only a small cheap one.

Now lets assume that the cap is just about fully charged to lets say 500 volts. Now the switch closes again(remember the motor is still turning) And here is where the magic comes. We now have a charged up capacitor sitting in the middle of two branches. Hmmm it says to itself. I have two choices where to put all my charge: To the left? nahhh I don't think so. There is a high resistance coil there and also a battery facing the wrong way... To the right then? Yeah wow a really low resistance fat mega juicy primary coil - thats the way I'll dump all my charges! So now 500 volts goes through a short thick primary with maybe 0.01 Ohm resistance. $500/0.01= 50\ 000$ watt or 50KW. Quite a discharge...

Of course this will be a FAST discharge, but who cares? The primary is resonantly coupled to the secondary, wich means that the potential reaching the output of the secondary is HUGE! somewhere between a few hundred thousands of volts up to over a million volts.

The frequency of the primary side must match the secondary side. in order to do this you design it so that the M and L coil/cap oscillates with the same frequency as N and P , where P is the capacity of the secondary terminals. wheter You connect the secondary to plates, wires etc and they all have a certain capacity.

This a first draft article. it might be edited later..

Lars

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